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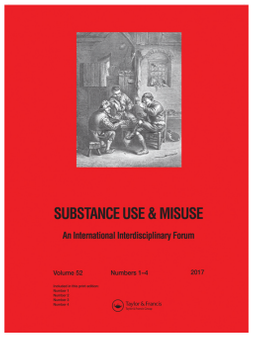

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ORIGINAL ARTICLE

Client Acceptability for Integrating Antiretroviral Therapy in Methadone Maintenance Therapy Clinics in Sichuan, China

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ABSTRACT

Background: Using methadone maintenance therapy (MMT) clinics to deliver antiretroviral therapy (ART) has proven to be effective for promoting treatment initiation and adherence in drug users living with HIV. *Objectives:* The objective of this study was to investigate the HIV-positive client acceptability of integrated ART services and to identify the reasons for and factors associated with service acceptability. *Methods*: A total of 86 HIV-positive MMT clients were recruited from 12 MMT clinics in Sichuan Province, China. They participated in a cross-sectional survey that queried their willingness to receive seven different types of MMT-based ART services. The reasons for their willingness/unwillingness to accept these services were documented. The association between service acceptability and background characteristics was examined. *Results:* The most accepted integrated services were ART-related counseling (75.6%) and referral (73.2%). Concerns regarding the provider's lack of ART expertise and confidentiality issues were common barriers for the acceptance of MMT-based ART services. A trust relationship with MMT providers was a reason for service acceptance. Service acceptability was associated with a poorer perceived health status. *Conclusions/Importance:* ART-related services, based on the client perspective, can be delivered at MMT clinics. However, service provider training and the protection of confidentiality must be strengthened for the effective implementation of integrated service delivery.

KEYWORDS

Acceptability; antiretroviral therapy; China; methadone maintenance therapy; service integration

The provision of optimal care to HIV-infected drug users has long been a major challenge (Vlahov & Celentano, 2006). Compared to individuals who do not use drugs, HIV-positive drug users are less likely to receive antiretroviral therapy (ART) (Gruskin, Ferguson, Alfven, Rugg, & Peersman, 2013; Zhang et al., 2011). For drug users who receive ART, support is particularly important because these individuals are at particular risk for non-adherence (Azar et al., 2015; Jiamsakul et al., 2014). A lack of adherence subsequently leads to drug resistance and suboptimal treatment outcomes (Sarang, Rhodes, & Sheon, 2013; Wolfe, Carrieri, & Shepard, 2010).

Methadone maintenance therapy (MMT) clinics provide a promising infrastructure to promote ART for drug users living with HIV because the clients receive their daily methadone dose at the clinic and establish a trust relationship with the MMT providers (Berg, Litwin, Li, Heo, & Arnsten, 2011; Tran et al., 2012). Literature has documented that MMT contributes to a more rapid initiation of ART among HIV-infected drug users (Uhlmann et al., 2010; Zhao et al., 2015) and a decreased rate of ART discontinuation (Reddon et al., 2014). A randomized controlled trial used this strategy to provide directly observed ART in MMT clinics and reported that this strategy was more efficacious than self-administered ART for improving adherence and reducing the HIV viral load among MMT clients (Berg et al., 2011).

Due to the benefits of MMT on ART, researchers have called for an initiative to integrate ART-related services into MMT clinics to maximize HIV treatment outcomes for HIV-positive drug users (Bachireddy et al., 2014; Lambdin, Mbwambo, Josiah, & Bruce, 2015). To implement this integrated service in real-world healthcare settings, the vital first step is to understand the acceptability of MMT-based ART services and preferences among its target users. The objective of the study was to investigate the acceptability of MMT-based ART services among HIV-positive MMT clients. This study was conducted in China. Since 2004, China has developed a nationwide network of 758 community-based MMT clinics in 28 provinces, which have cumulatively treated more than 384,500 clients (Wu, Sullivan, Wang, Rotheram-Borus, & Detels, 2007; Yin et al., 2015). However, MMT-based ART services remain largely unavailable in the

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country (Zhao et al., 2015), and little is known about the clients' level of acceptance of different types of integrated ART services. In this study, we interviewed HIV-positive MMT clients regarding acceptability and their reasons for accepting/rejecting different types of MMT-based ART services. Factors associated with the acceptability of the services were also identified.

Methods

Study setting and participants

The study was conducted in Sichuan Province, China, from January to September 2013. Twelve MMT clinics with the highest HIV caseload were included in the study. The study participant eligibility criteria were as follows: (1) 20 years or older; (2) an HIV-positive diagnosis confirmed by Western blot; and (3) a current client of one of the 12 selected MMT clinics. Current ART status was not a criterion for inclusion or exclusion of study participants.

Procedure

At the time of the study, a total of 143 MMT clients met the eligibility criteria in the 12 selected MMT clinics, and the MMT service providers informed all clients of the study. The study information was communicated verbally and with a printed flyer. Approximately 60% ($N = 90$) of the clients demonstrated an interest in participating and were referred to our study recruiters. Our study recruiters met with the potential participants in a private room and explained the study purpose and procedure, the nature of confidentiality, the potential benefits and risks and their right to refuse to participate or withdraw without any penalty. Written informed consent was obtained prior to data collection. Ethics approval was obtained from the Institutional Review Boards of University of California, Los Angeles and the National Center for AIDS/STD Control and Prevention, Chinese Center for Disease Control and Prevention.

Data collection

The participants completed a brief survey, which took approximately 20 minutes to finish. The survey was conducted in a private room of the MMT clinic. The survey was administered using the Computer Assisted Personal Interview (CAPI) method, with trained interviewers reading questions to the participants and entering their responses directly on laptop computers. The participants received 30 yuan ($4.80 USD) for their time and effort.

Measures

The participants were asked about the acceptability of receiving seven types of services from MMT providers. The seven types of ART-related services, which were predesigned by the research team and a local expert panel based on previous research (Achmad et al., 2009; Berg et al., 2011; Wolfe et al., 2010) and the potential for incorporation into local MMT clinics, included the following: (1) directly observed ART dosage once per day; (2) phone call reminders to take ART medication; (3) text-message reminders to take ART medication; (4) ART-related counseling; (5) ART-related referrals; (6) peer support groups in the MMT clinic to improve ARV treatment adherence; and (7) involvement of family members in support of ART adherence. The responses were either 1 = Yes or 0 = No. A general acceptability score was generated by summing all positive answers (1 = Yes). For each type of service, the reasons for willingness/unwillingness of acceptance were probed using open-ended questions, and the responses were recorded verbatim.

The background characteristics collected in this study included age, gender, marital status, years of education, personal income in the previous 30 days, local residence, date of MMT admission, years since HIV diagnosis, current ART status, HIV-serostatus disclosure, and perception of health status. The duration of MMT use (in years) was computed by subtracting the reported date of admission to the MMT clinic from the date of assessment. The HIV-serostatus disclosure was a single composite measure (Lee et al., 2010) based on the extent to which the participant has disclosed his/her serostatus to various groups of people, such as sexual partners, children, other family members/relatives, friends, neighbors, health care workers, community/village leaders, people in the community/village, coworkers, and others. The response categories included 0 = none of them, 1 = some of them, and 2 = all of them. Based on the 10 items, a summative composite scale was developed, with a range of 0 to 20 (Cronbach's alpha = 0.84). The participants' perception of their health status was measured using the Medical Outcomes Study-HIV Health Survey (MOS-HIV) general health perception subscale (Ichikawa & Natpratan, 2004).The participants were asked to evaluate their health in general (from 1 = very good to 5 = very poor), and evaluate the following: (1) whether they were somewhat ill, (2) whether they were as healthy as anybody they know, (3) whether their health was excellent, and (4) whether they had been feeling bad lately. Each of the above four items ranged from 1 = definitely true to 5 = definitely false. After reversing some of the items, all responses were summed to generate an overall perceived health score, with higher scores indicating a better perceived health status (Cronbach's alpha = 0.86).

Data analysis

The statistical analyses of the quantitative data were performed using the SAS 9.4 (SAS Institute Inc., Cary, NC, USA) statistical software package. We first descriptively analyzed the frequency distribution of the demographics, and drug use-related factors were summarized. Second, the number and percentage of participants who indicated a willingness to accept each type of service were calculated to determine the acceptability of the services. A grounded theory approach was used to examine patterns and emergent themes across the responses to the open-ended questions regarding the reasons for acceptance/rejection of services (Corbin & Strauss, 1990). Third, we conducted an exploratory factor analysis to examine the structure of the seven types of services and categorized the different types of services into three dimensions (Suhr, 2005). Rotated factor loading of 0.40 was used as a cut-off point for the inclusion of a service in a certain dimension. Pearson's correlations (r) were calculated to investigate the relationships between background characteristics and the acceptability of each dimension of service. A multiple linear regression analysis was performed to examine the correlation between the general acceptability score and the background characteristics.

Results

Study sample

A total of 90 participants were recruited; four did not answer the acceptability-related questions and were excluded from the analysis. Of the 86 participants who completed the questionnaire, 72.1% were male. The mean age was 41.4 years, and approximately half ($N = 46$, 53.5%) of the participants were between 40 and 49 years of age. The average income in the past 30 days was 585.1 yuan (approximately $94 USD), and approximately one-third ($N = 28$, 33.7%) of the participants did not have any income in the last 30 days. The participants had used MMT for an average of 4.3 years, and they had been diagnosed as HIV-positive for an average of 6.3 years. Less than one-third (29.1%) of the participants were currently receiving ART (Table 1).

Table 1. Sample description ($N = 86$).

	N	%
Female	24	27.9
Age (mean ± SD)	41.4	5.7
Younger than 40 years	33	38.4
40–49 years	46	53.5
More than 50 years	7	8.1
Married	36	41.9
Years of education (mean ± SD)	8.9	2.5
Equal to or less than 6 years	21	24.4
7-9 years	40	46.5
More than 10 years	25	29.1
Income in the past 30 days (mean ± SD)	585.1	1182.6
Zero	28	33.7
Less than 500 yuan[1]	33	39.8
More than 500 yuan[1]	22	26.5
Years in MMT (mean ± SD)	4.3	2.8
Less than 3 years	31	36.1
3-6 years	27	31.4
More than 6 years	28	32.6
Years since HIV diagnosis (mean ± SD)	6.3	3.7
Less than 5 years	29	34.1
5-10 years	38	44.7
More than 10 years	18	21.2
Currently on ART	25	29.1
Disclosure[2] (mean ± SD)	7.8	4.7
Health perception[3] (mean ± SD)	12.6	4.6

[1] 1 yuan = 0.16 USD = 0.12 EUR (as 2013)
[2] Disclosure: the extent to which the participant has disclosed his/her HIV serostatus to various groups of people (sexual partners, children, other family members/relatives, friends, neighbors, health care workers, community/village leaders, people in the community/village, coworkers, others) (Lee et al., 2010).
[3] Health perception: perception of health status, measured using Medical Outcomes Study-HIV Health Survey (MOS-HIV) general health perception subscale (Ichikawa & Natpratan, 2004).

Acceptability of MMT-based ART services

Figure 1 shows the percentage of acceptance of each type of service. The most accepted integrated services were ART-related counseling services (75.6%), followed by referral services (73.3%). The acceptability of the other five types of services ranged from 53% to 60%. The clients who were currently receiving ART were more likely to accept directly observed ART, counseling, referral, and support groups and less likely to accept reminder services. However, the differences did not reach statistical significance. The reasons for willingness/unwillingness to accept each type of service are summarized below.

Directly observed ART dosage

The acceptability of directly observed ART varied. Some participants were open to keeping their ART medication in the MMT clinic and having MMT providers supervise them taking their medication, although other participants did not accept this option because their MMT visit schedule would conflict with their ART dosing habits.

- I am okay with it. I have to come here for methadone anyway. It is convenient to take a dose of ART drugs at the same time (male, 41 years, not on ART).
- It depends on if other people are doing the same (female, 40 years, not on ART).
- I do not want to leave my medicine in the MMT clinic. If someday I would not be able to come to the clinic, I would miss a dose. It is convenient for me to keep the medicine with me so that I can take a dose before I go to bed (male, 46 years, on ART).
- I prefer to just take the medicine at home. I usually just keep my medicine in a very visible place at home

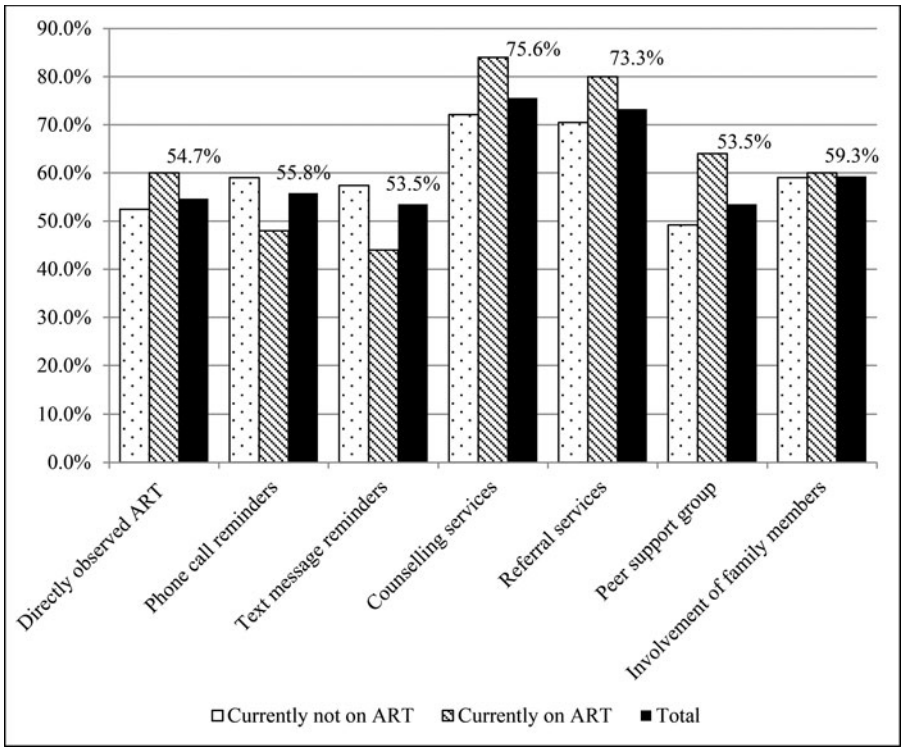

Figure 1. Percentage of acceptance of each type of service by ART status.

so that I will not forget. I am concerned that if I took the medicine here, other people would see it and find out my HIV status (female, 45 years, not on ART).

Phone call reminders for ART dosing

A phone call reminder would be unfeasible for those who do not personally own a phone. Concerns regarding confidentiality issues when delivering phone call reminders were common. The participants suggested that the providers should be meticulous when phrasing the reminder messages, such that no terms that would potentially disclose their HIV serostatus were mentioned.

- Please be careful when making those phone calls, do not mention HIV or AIDS or that type of thing because I am afraid people around me would hear it (female, 54 years, not on ART).
- I do not think I will forget to take medicine. A reminder would be helpful, but the problem is that I do not personally own a cellphone. I use my parents' landline, so it is not really convenient when they are around (female, 27 years, on ART).

Text message reminders for ART dosing

Although slightly more participants indicated willingness to accept a phone call reminder than a text message reminder (55.8% vs. 53.5%), several participants expressed their preference for a text message reminder over a phone call reminder because a text message reminder was perceived as more private and more convenient. The participants also suggested frequencies for delivering the reminders.

- I am more comfortable receiving text messages because I feel like text message reminders are more private than phone calls (male, 40 years, not on ART).
- It is not necessary to send a reminder every day. Once every few days would be good enough (male, 50 years, not on ART).
- I prefer text messages over phone calls. Sometimes it is inconvenient for me to pick up the phone (male, 47 years, not on ART).

ART-related counseling

Counseling services were generally well-accepted, mainly due to the established trust relationship between the clients and the MMT providers. However, a number of participants noted that the MMT providers had inadequate knowledge regarding AIDS treatment, which they learned from their previous encounters. This belief has, to a large extent, reduced their willingness to seek ART-related counseling from MMT providers.

- It would be great if counseling services were provided here because I have a very close relationship with the doctors here (male, 33 years, on ART).
- Although the doctors here are nice to us and really care about us, I do not really ask them ART-related questions. I think it is not their specialty. I prefer to

ask the CDC doctor; they know more and explain things better (male, 46 years, on ART).

- I have consulted them before, but they did not really know the answer. I once asked them if I could take the medication at a different time, if I need to adjust the dosage, and how to manage my severe side-effects, and they had no idea. I think it is a waste of time. I should just consult an AIDS specialist (male 46 years, on ART).
- I do not feel comfortable consulting the doctor here because other clients would find out. If there were a private room I would be willing to (undergo consultation). After all, I would like to know more about AIDS treatment, and it would be more convenient for us to consult the doctors here (female, 27 years, on ART).

ART-related referral services

The participants indicated that referral services would be helpful for them because the MMT providers were perceived as resourceful. However, the additional cost of other healthcare services was cited as a cause of concern for some of the participants.

- Referral services would be good. Presumably, they know which hospital provides better treatment (male, 46 years, on ART).
- I do not need referral services because I do not have money to receive other hospital services; they are always expensive. The last time I went to the infectious disease hospital, the pre-ART physical checkup cost me a fortune. I spent so much money and still did not get the treatment because my liver function was not good enough. They suggested that my liver should be treated first, but I do not have the money to do so. Therefore, I decided not to get ART because my disease is not curable anyway; you can only control it. In addition, I know ART has severe side effects (male, 47 years, not on ART).

Peer support group for ART adherence

Although some participants had positive experiences attending peer support groups in the past, others perceived such services as unnecessary. The disclosure of their HIV-positive serostatus was reported to be the major concern that reduced the participants' willingness to participate in peer group activities.

- I am willing to participate in any type of group activities. I did so before (male, 42, on ART).
- I do not want to because people gossip. I do not want other people to know (female, 54 years, not on ART).
- I am pretty compliant with the doctor's instructions already. I do not think I need help from other people (male, 41 years, on ART).

Involvement of family members for ART adherence

The trust relationship with MMT providers augmented the participants' willingness to invite their family members to events organized by the MMT clinic. Nonetheless, several participants mentioned autonomy and a reluctance to add a greater psychological burden to their family members. At the same time, the involvement of family members was not a practical option for those who have not disclosed their serostatus.

- I would be willing to invite my families to the clinic. They trust the doctors here very much. They really believe in whatever they say (male, 41 years, not on ART).
- I do not want to discuss this (HIV) with my families. My father is old. I do not want him to worry because it is not good for his own health. Additionally, he would not be able to make decisions for me (male, 47 years, not on ART).
- Some of my family members, for example my in-laws, do not know my status yet. This is personal and nothing to be proud of (male, 30 years, not on ART).

Factors associated with service acceptability

Factor analysis of the seven types of services indicated a three-factor structure. Examination of factor loading and content suggested that the seven types of services represented three construct domains. Domain 1 consisted of directly observed ART, peer support groups, and the involvement of family members, and this domain was referred to as social support-related services. Domain 2, categorized as reminder services, included phone call reminders and text message reminders. Domain 3 included counseling and referral services and was called referred to as services. The participants who were currently receiving ART, those who have been diagnosed with HIV infection for a longer period of time, and those who perceived themselves as having poorer health conditions were more likely to accept social support-related services. No factors were found to be significantly correlated with reminder services. Self-perceived health status was negatively associated with the acceptability of clinical services (Table 2). The general acceptability score was significantly correlated only with health perception ($\beta = -0.16$, $p = .0216$) after controlling for other covariates.

Discussion

This study demonstrated a median to high level of acceptability of MMT-based ART services among HIV-positive MMT clients, which indicates that an MMT clinic-based ART program is a feasible strategy for promoting ART initiation and supporting ART adherence in China. The

Table 2. Pearson's correlation coefficient and corresponding *p*-values with service acceptability[a].

	Social support	Reminder services	Clinical services
Female	0.13	0.12	0.17
	0.2427	0.2641	0.1120
Age	−0.09	−0.16	−0.08
	0.3935	0.1518	0.4899
Married	−0.06	0.17	0.04
	0.6003	0.1265	0.6917
Years of education	0.16	0.13	0.18
	0.1338	0.2286	0.0976
Income in the past 30 days (yuan)	0.14	0.20	0.17
	0.1849	0.0635	0.1232
Years in MMT	0.17	0.08	0.06
	0.1130	0.4610	0.5587
Years since HIV diagnosis	0.22	0.02	0.00
	0.0398*	0.8255	0.9775
Currently on ART	0.25	−0.12	0.13
	0.0182*	0.2872	0.2498
Disclosure	0.17	0.08	0.08
	0.1088	0.4404	0.4803
Health perception	−0.27	−0.15	−0.26
	0.0110*	0.1777	0.0143*

* $p < .05$

[a] Service acceptability: the acceptability to receive ART-related services provided by MMT providers (the participants could answer 1 = yes or 0 = no to each of the seven different types of services). The seven types of services were categorized into three domains: social support, reminder services, and clinical services. Social support-related services consisted of (1) directly observed ART, (2) peer support groups, and (3) involvement of family members. Reminder services included (1) phone call reminders and (2) text message reminders. Clinical services included (1) counseling and (2) referral services.

acceptability is credited to the trust relationship with MMT providers established through daily contact (Li, Wu, Cao, & Zhang, 2012). However, the integration of ART into MMT programs warrants strategic planning. The level of acceptability varied across the different types of services. It is critical to build a patient-centered model of care, such that the services provided are tailored to the specific needs of different groups of clients (Duncombe et al., 2015). The clients with poor health conditions should be the first to receive the integrated services because they exhibit a higher level of service acceptability than those who are relatively healthy.

When planning the integrated services, MMT stakeholders should consider adopting the most accepted service components as the first step. Clinical services, including ART-related counseling and referral, demonstrated the highest acceptability across all service types in the study. However, the MMT service provider's lack of expertise in this area was a prominent concern. This was also echoed in a focus group with MMT service providers (Lin, Cao, & Li, 2014). Providing integrated MMT and ART care is challenging because service providers usually do not have expertise in both addiction medicine and HIV care, which are two separate areas. The development of an MMT-ART provider network with formal governance and management is a more viable strategy to provide comprehensive and seamless care (Haire et al., 2012).

Concerns regarding confidentiality should be addressed when planning the implementation of integrated services. In particular, for the delivery of phone calls and text message reminder services, the provider should be cautious when choosing the appropriate wording and avoid using phrases that would disclose the HIV serostatus of the client. Other types of services, particularly those involving friends or family members, may only be feasible for those who have fully disclosed their HIV-serostatus.

Directly observed dosage has been proven to improve treatment adherence and decrease HIV viral replication (Pearson et al., 2006). Nonetheless, the lack of confidentiality and conflict with self-dosing habits poses a major concern, which reduces the feasibility of delivering this service to MMT clinics. Similar findings have also been reported in other studies (Saberi, Caswell, Jamison, Estes, & Tulsky, 2012; Wohl et al., 2003). Instead of imposing this type of service on the client, the provider should change tactics by informing the clients of the importance of treatment adherence, providing the clients with specific medication instructions, introducing mobile applications to support adherence, and guiding the client to establish a medication-taking routine.

This study was limited by a high refusal rate and the corresponding self-selection bias. Furthermore, we could not predict the actual use if the ART-related services were provided. Due to the small sample size, this study could not identify the differences that may exist across the 12 separate MMT clinics. However, this study provided insights into the strategic planning of MMT-ART service integration. Stakeholders need to consider the provision of multiple strategies instead of following a single algorithm, such that the HIV-positive clients can choose the most suitable combination of services based on personal and relationship-based preferences. Enhanced in-service training for MMT providers and confidentiality protection are necessary to heighten the acceptability and optimize the integration of service delivery.

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Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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